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P13
35. (New) A sheet processing apparatus according to claim 34, wherein the holes are aligned along a direction that is perpendicular to the conveying direction of the sheet.--

REMARKS

Claims 11-23 and 26-35 are now pending in this application for which applicants seek reconsideration.

Amendment

Applicants propose amending Fig. 1 to correct the reference inconsistencies. The specification has been amended to reflect the proposed changes to the drawings, as well as to remove the informalities identified by the examiner. Non-elected claims 1-10, 24, and 25 have been canceled.

Claims 11-17, 18, 19, and 21-23 have been amended to improve their form and readability, as well as to clarify that the end position of the sheet refers to the side edge of the sheet. The side edge of the sheet extends along the conveyance direction of the sheet (or the end edge of the sheet along the width direction, which is perpendicular to the conveyance direction). See pages 24, 32, and 33 for support, for example. Applicants submit that all of the changes made in the claims are for purposes of improving the form and clarifying the intended meaning of the claims as originally filed.

New claims 26-35 have been added to further define the present invention.

No new matter has been introduced.

Restriction

Non-elected claims 12 and 15-23 remain pending in this application since they depend from elected independent claim 11. Upon allowance of claim 11, these claims must be allowed. In this regard, applicants urge the examiner to withdraw the restriction. Restriction between the same group of claims (depending from the same independent claim) is believed to be improper unless the restriction relates to species or different embodiments.

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Drawing/Specification Objection

The proposed drawing amendment will obviate multiple designation of the same reference numerals. The specification has been amended to include references "S21", "S24", and "S59" illustrated in the drawings, as well as to correct the informalities identified by the examiner.

Art Rejection

Claims 11, 13, and 14 were rejected under 35 U.S.C. § 102(b) as anticipated by Yamauchi (USP 6,014,920). Applicants traverse because Yamauchi would not have disclosed or taught the claimed control means for controlling the timing of the detecting operation by the claimed detecting means so that the detecting means detects the side edge of the sheet at a vicinity of a sheet processing position at which the sheet processing means processes the sheet.

Yamauchi discloses a paper-punching device for use in an image-forming apparatus. The paper-punching device punches holes through sheets that have been subjected to image-forming operations. Yamauchi's photosensor 32, 164 detects either the rear edge or the side edge. Its punching device 162 shifts based on the detection signal to activate its punching member 38. This allows holes to be formed at a fixed constant distance from either the rear edge or side edge of the sheet, and parallel thereto, regardless of the width or length of the sheet. See Yamauchi, Column 4, lines 11-14 and Column 35, lines 9 to 25. In Yamauchi, the punched holes are aligned parallel to the detected edge.

In the claimed invention, the timing of the detecting means is controlled so that the side edge of the sheet (or as originally claimed, the end position of the sheet extending in a direction at a right angle relative to the conveying direction) is detected near the sheet processing position. Note that the original language in claim 11 has been amended to improve its readability by defining the detection in terms of a side edge rather than an end position. The meaning and scope remain the same as originally claimed. In Yamauchi, there is no control means for controlling the timing of the detecting operation of the detecting means since it merely relies on the detecting edge to trigger the punching operation.

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Moreover, new claim 28 recites that the detecting means is movable in the width direction together with the sheet processing means. Yamauchi also does not disclose this feature.

Moreover, new claims 30, 32, and 35 specify that the sheet processing means punches holes through the sheet, and that the holes are aligned along a direction that extends perpendicular to the conveying direction of the sheet. In contrast, Yamauchi discloses detecting the trailing edge (the edge that extends perpendicular to the conveying direction) to punch holes that are aligned parallel to the trailing edge, whereas these claims call for detecting the side edge for punching holes that are aligned parallel to the trailing edge.

Conclusion

Applicants submit that pending claims 11-35 patentably distinguish over the applied reference and thus urge the examiner to issue an early Notice of Allowance. Should the examiner have any issues concerning this reply or any other outstanding issues remaining in this application, applicants urge the examiner to contact the undersigned to expedite prosecution.

Petition for Extension of Time

The period for response having expired on August 6, 2002, applicants hereby petition for a one month extension of time. The Commissioner is authorized to charge the one month extension fee of \$110.00 to Deposit Account 18-2056, along with any additional fees that may be required to maintain the pendency of this application.

Respectfully submitted,

Date: 08/15/02


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ATTACHMENT
MARKED UP VERSION

IN THE SPECIFICATION:

Page 14, the paragraph appearing in lines 2-3 has been amended as follows:

--FIGS. 3A to 3C are [a] views useful in explaining a punching operation performed by a punching unit 50;--

Pages 16-17, the paragraph spanning these pages has been amended as follows:

--The image forming apparatus 102 has a plurality of recording sheet storage sections 53 and 54 that have sheets S (SH1, SH2) of different sizes loaded therein, and recording sheet feeding sections 55 and 56 for feeding recording sheets. A fed sheet S is conveyed to a sheet conveyance path 60 via a sheet conveyance path 57. Reference numeral 61 designates a laser scanner for scanning laser light based on image information read. by the optical system 52, to form a latent image (toner image) on a photosensitive body of an image forming section 62.--

Pages 20-21, the paragraph spanning these pages has been amended as follows:

--Reference numeral 84 designates a processing tray unit including an intermediate tray 82 (hereinafter referred to as "the processing tray") for temporarily accumulating sheets, aligning the accumulated sheets S or insert sheet I, and stapling them using a staple unit, and an aligning plate 88 for aligning the sheets S or insert sheet I loaded on the processing tray. The processing tray 82 stacks the sheets S and insert sheet I conveyed thereto with their image formed surfaces facing downward in such a manner that their image formed surfaces remain facing downward. The aligning plate 88 aligns the sheets stacked on the processing tray 82 with their image formed surfaces facing downward so as to correct deviation of the sheets in a direction at a right angle to a sheet conveying direction (a perpendicular direction, that is, a sheet width direction), and correct skewing thereof. The [stable] staple unit 80 staples rear end portions of the sheets

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accumulated and aligned with their image formed surfaces facing downward. Consequently, the sheets with images formed thereon can be sequentially discharged in a fashion facing downward, starting with the top page, so that for example, in an image forming apparatus having a copying function and a facsimile or printer function, processing can be started with the top page whatever function is used. Further, the staple unit 80 can be provided in the main body of the image forming apparatus 102. As a result, the user can obtain output results in which the correct page order and image orientation are obtained with a binding position formed on the left side of the sheet as viewed from the image formed surface and without the need to increase the size of the sheet processing apparatus 103 and complicate the construction of the same. Therefore, the apparatus can be operated more easily and has improved productivity, cost performance, and the like. In this connection, the punching process is also controlled such that the sheet is punched at a rear or trailing end portion thereof.--

Pages 22-23, the paragraph spanning these pages has been amended as follows:

--Reference numeral 20 designates an insert sheet storage section for setting therein insert sheets I with images previously formed thereon and which are to be inserted into sheets fed from the image forming apparatus main body. Reference numeral 21 designates a feed roller for feeding insert sheets, and reference numeral 22 designates a separating roller for separating the fed insert sheet(s) from the other insert sheets (in the present embodiment, sequentially separating and feeding the insert sheets starting with a top layer sheet). Reference numeral 27 designates an insert sheet set detecting sensor for detecting whether an insert sheet or insert sheets are set in the insert sheet storage section 20. The fed insert sheet I is conveyed to the conveyance roller 2 by means of conveyance rollers 23, [34]24, 25, 26.--

Page 37, the paragraph appearing in lines 15-24 has been amended as follows:

--When the sheet detecting sensor 93 detects the trailing end of the sheet, the

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controller circuit section 200 calculates, based on the punch offset (X) corresponding to the punching position on the sheet 5, the wait time before starting punch slide driving, and then actuates the timer. When the calculated wait time has elapsed, the controller circuit section 200 drives the punch drive motor, not shown, to rotatively drive the punches 91 and [dices] dies 92 of the punching section 90 to punch the sheet S.--

Pages 42-43, the paragraph spanning these pages has been amended as follows:

--The CPU waits until the punch slide HP sensor 94 detects the punch slide HP defining section 95 (step S20). When the punch slide HP defining section 95 is detected, the CPU 2002 stops the movement of the punching section 90 and sheet end detecting sensor 93 toward the punch slide HP (step S21).--

Page 43, the paragraph appearing in lines 4-8 has been amended as follows:

--The CPU 2002 waits until the punching position detecting sensor 99 detects the punch HP (step S22). When the punch HP is detected, the CPU 2002 stops the rotative movement of the punches 91 and [dices] dies 92 (step S23) and returns to the processing at the step S4.--

Page 54, the paragraph appearing in lines 6-22 has been amended as follows:

--Then, the CPU 2002 determines whether the distance K between the sheet detecting sensor 31 and the sheet end detecting sensor 93 is equal to or larger than the minimum punchable length L in the sheet conveying direction (step S56). If the CPU 2002 determines that the distance K between the sheet detecting sensor 31 and the sheet end detecting sensor 93 is equal to or larger than the minimum punchable length L in the sheet conveying direction, it waits until the sheet detecting sensor 31 detects the trailing end of the sheet (step S57). When the sheet detecting sensor 31 detects the trailing end of the sheet, the CPU 2002 starts the timer A (step S58), and calculates the wait time before starting the punch rotation driving, depending upon the predetermined punching position

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(the position at the distance X from the trailing end of the sheet) in the sheet conveying direction (step S59).--

Page 57, the paragraph appearing in lines 20-27 has been amended as follows:

--Subsequently, the CPU 2002 determines at the step [S24] S54 whether or not this job has been completed. If the CPU 2002 determines that the job has been completed, it returns to the processing at the step S51 to prepare for the next job. On the other hand, if the CPU 2002 determines at the step S54 that the job is to be continued, it returns to the processing at the step S52 to continue the image forming operation.--

IN THE CLAIMS:

Claims 11-15, 18, 19, and 21-23 have been amended as follows:

--11. (Amended) A sheet processing apparatus comprising:

sheet processing means for [executing] processing a sheet [process to a sheet] having a side edge;

conveying means for conveying the sheet to be processed by said sheet processing means;
detecting means for detecting [an end position] side edge of the sheet, the side edge extending along [in a direction at a right angle relative to] a conveying direction of the sheet; and
control means for controlling said sheet processing means to [execute] process the sheet [process to] at a position based on a detection result of said detecting means on the sheet, after a detecting operation by said detecting means; and

wherein said control means controls timing [for starting] of the detecting operation by said detecting means so [as to execute the detecting operation] that said detecting means detects the side edge of the sheet at a vicinity of a sheet processing position [on] of the sheet at which [said sheet process is executed by] said sheet processing means processes the sheet.

12. (Amended) A sheet processing apparatus according to claim 11, wherein said control

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means determines said timing [for starting] of the detection operation of the [end position] side edge of the sheet by said detecting means, based on a length of the sheet in the conveying direction of the sheet.

13. (Amended) A sheet processing apparatus according to claim 11, wherein said sheet processing means is [capable of executing the sheet process on] adapted for processing plural types of sheets of different lengths in the conveying direction of the sheets, and wherein said control means [sets] controls the timing [for starting] of the detection operation of detecting the side edge [an end position] of each of the plural types of sheets [in the direction at a right angle relative to the conveying direction of the sheets] by said detecting means depending on [a] the length of each of the plural types of sheets in the conveying direction of the sheets.

14. (Amended) A sheet processing apparatus according to claim 13, wherein if the sheet process is carried out on a sheet of a first size or a sheet of a second size having a larger length in the conveying direction of the sheets than said sheet of the first size, said control means delays the timing [for starting] of the detection operation of detecting the side edge of the said sheet of the second size with respect to the timing [for starting] of the detection operation of detecting the side edge [the end position] of said sheet of the first size.

15. (Amended) A sheet processing apparatus according to claim 13, wherein said control means sets the timing [for starting] of the detection operation of detecting the [end position] side edge of each of said plural types of sheets by said detecting means to different values of timing according to the different lengths of said plural types of sheets in the conveying direction of the sheets such that the detection of the [end position] side edge of each of the sheets is always carried out at the location close to said sheet processing position.--

—18. (Amended) A sheet processing apparatus according to claim 17, wherein said control means is responsive to [starting of] the detection of the [end position] side edge of the

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sheet by said detecting means, for moving said sheet processing means together with said detecting means.

19. (Amended) A sheet processing apparatus according to claim 11, wherein said control means causes said sheet processing means to [execute] process the sheet [process] without stopping the conveyance of the sheet by said conveying means.--

--21. (Amended) A sheet processing apparatus according to claim 11, wherein said sheet processing means [executes] processes the sheet [process on the sheet] without executing a sheet aligning process on the sheet.

22. (Amended) A sheet processing apparatus according to claim 11, wherein said sheet processing apparatus [can be connected] is adapted for to an image forming apparatus for forming images on a sheet, and wherein said sheet processing means [executes] processes the sheet [process on a sheet] supplied from said image forming apparatus.

23. (Amended) A sheet processing apparatus according to claim 22, wherein said control means controls timing [for starting] the processing of the sheet [process to be executed on the sheet] by said sheet processing means together with the timing [for starting the] of detection of the [end position] side edge of the sheet by said detecting means, such that said sheet processing means [executes] processes the sheet [process on the sheet] having an image formed surface thereof facing downward[,] at a trailing end thereof.--